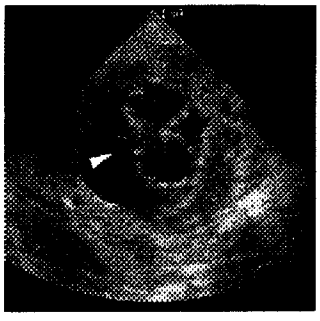
Results: 15 pts have undergone LVR, age 34–68 (mean 50.2 yrs, 11 male), exclusively for idiopathic cardiomyopathy. Pre-operatively, 11/15 had grade 3^+ or 4^+ mitral regurgitation (MR), related to annular dilation and poor coaptation. One patient had St Jude replacement. 10/11 pts had a Cosgrove-Edwards annuloplasty ring placed. 14 pts had the tack stitch placed (see fig arrow). Post-pump, all pts had 0^+ to trace MR. The unique double-orifice appearance did not cause stenosis. One patient required transplantation of the anterolateral papillary muscle to allow a larger myocardial excision. Intermediate follow-up (mean 28 days) showed 12/15 had trivial MR, 2+ MR in 2 and 3+ in 1.



Conclusions: Left ventricular remodeling surgery grossly distorts papillary muscle geometry. A unique valvuloplasty involving a stitch between the mid-portion of the leaflets with or without annuloplasty provides excellent valve competence without stenosis.

1018-32 New Insights Into the Pathology of Degenerative Mitral Valve Incompetence. A Histomorphometric Study

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Predictability of the results of mitral valve repair (MVR) for degenerative mitral valve incompetence (DMI) is an important source of concern. The *aim* of our study was to examine quantitatively the histological changes in degenerative mitral valves from 130 patients (pts) who underwent MVR for DMI. Pts were divided into 4 groups according to the clinical patterns and operative findings as follows: Barlow's Disease (BD) (n = 39), Fibroelastic Deficiency (FED) (n = 44), Marfan Syndrome (MS) (n = 15) and undetermined condition (n = 32). The specimens obtained at surgery were examined under blind conditions. Histologic scores of severity were applied to lesions (myxoid infiltration, collagen and elastic fiber lesions): O: normal, 1: minimal, 2: moderate, 3: severe lesions. Statistically, a discriminant analysis classified the pts into the groups defined clinically, according to the histologic scores. *Results:* All pts with the MS were recognized by the statistical procedure, as were all but one FED pts. There was no clear distinction between the histologic patterns of MS and BD. When the age of the pts and the size of the prosthetic ring used for repair were added to the histologic parameters, all pts were rightly classified. Half of the 32 pts with no determined disease were considered statistically to have distinctive clinical and histological patterns.

Our histomorphometric data show a clear distinction between FED and other conditions. Histological examination of the excised valves is of important use for the predictability of the success of valve repair in different diseases responsible for DMI.

1018-33 Multivariate Predictors of Biomechanical Properties in Myxomatous Mitral Valve Disease

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Structural abnormalities in valve tissue are thought to be responsible for leaflet prolapse and regurgitation in myxomatous valve disease. We wished to determine the independent predictors among clinical and echo data of biomechanical properties (BMP) of mitral tissue excised at valve repair. *Methods:* We studied 32 pts (28 males), mean age 57 ± 10 (SD) years undergoing mitral valve repair. An echo score of leaflet thickness, leaflet and annular calcification, redundancy, degree of prolapse and tricuspid valve (TV) involvement was generated. Mitral leaflet thickness (LT) and LV size was measured by echo. We determined BMP of the valve tissue excised at surgery: geometry (size, weight, volume), stiffness and failure variables. We used multiple regression analysis to determine the independent predictors of BMP among the clinical and echo variables.

Results:

BMP	Independent Predictors	r^2	p
Geometry	Echo score	0.58	< 0.001
Stiffness (kPa)	LV diameter, LT	0.62	< 0.0001
Failure Tension (N/mm)	TV redundancy, LT Murmur duration	0.58	< 0.0001

Conclusions: 1. Much of the variability in structural abnormalities of myxomatous tissue is predicted by easily acquired clinical and echo variables. 2. Predicting structural abnormality noninvasively may prove useful in assessing disease severity and timing of intervention.

1018-34 Echocardiography Can Identify Patients for Mitral Valve Repair

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Mitral valve (MV) repair decreases the incidence of pathologic complications when compared to MV replacement. Echocardiographic variables that predict the surgical decision to perform MV repair have not been well determined. We retrospectively analyzed transesophageal echocardiograms (TEE) of 51 pts (35 MV repair, 16 MV replacement; mean age 57 years, range 20–82; 27 male and 24 female) with mitral regurgitation who underwent MV surgery by two surgeons at two institutions. TEE variables included LA size, annular diameter, mitral annular calcification, leaflet mobility, leaflet thickness, leaflet length, prolapse or flail leaflet, maximal chordal length, chordal rupture, severity and characteristics of the mitral regurgitant jet, and left ventricular size and function.

Transesophageal Variables Favoring Mitral Valve Repair

	Repair	Replacement	p Value
Posterior Leaflet Length (mm)	24 ± 5	16 ± 3	< 0.0001
Anterior Leaflet Length (mm)	33 ± 5	28 ± 5	< 0.01
Annular Diameter (mm)	43 ± 7	38 ± 10	< 0.06
Chordal Length (mm)	33 ± 8	28 ± 7	< 0.08

Using discriminant analysis, repair versus replacement was correctly predicted in 45 of 51 (88%) pts with a sensitivity of 86% and specificity of 94%.

Conclusions: Transesophageal echocardiography can identify patients with mitral regurgitation who will undergo MV repair as opposed to replacement.

1018-35 Characteristic Systolic and Diastolic Mitral Leaflet Configuration in Patients with Incomplete Mitral Leaflet Closure: Evidence for Mitral Valve Tethering

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Competing explanations for mitral regurgitation (MR) with incomplete mitral leaflet (MV) closure (IMLC) include global LV dysfunction vs geometric changes causing abnormal leaflet tethering. These factors often coexist, but clinical observations provide clues in favor of tethering: 1) *systolic* anterior leaflet (AL) abnormal bending, suggesting nonuniform forces from tensed strut chordae, and 2) *diastolic* leaflet opening restricted to the line connecting

	IMLC(+) EF ≤ 30%	IMLC(−) EF ≤ 30	Control
Angled AL (syst.)	32136*#	0/22	0/21
Restricted opening	30/36*#	0/22	0/21
Opening angle α(°)	16 ± 10*#	58 ± 13*	67 ± 8
LVEF (%)	24 ± 6*	27 ± 4*	61 ± 5

*p ≤ 0.05 to control, #p ≤ 0.05 to IMLC(−).